No. 2291

United States

Circuit Court of Appeals

For the Ninth Circuit.

DETROIT COPPER MINING COMPANY OF ARIZONA, a Corporation,

Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Appellee,

and

ARIZONA COPPER COMPANY, a Corporation,

Appellant,

vs.

THE MINE AND SMELTER SUPPLY COMPANY, a Corporation,

Appellee.

Defendant's Exhibit "J," Certified Copy of File Wrapper and Contents of Wilfley Patent No. 590675.

Received August 27, 1913.

F. D. MONCKTON,
Clerk.

By MEREDITH SAWYER, Deputy Clerk.

[Defendant's Exhibit "J"—Certified Copy of File-Wrapper and Contents of Wilfley Patent No. 590,675.]

2—389.

UNITED STATES OF AMERICA,
DEPARTMENT OF THE INTERIOR.
PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify That the annexed is a true copy from the Records of this office of the File Wrapper and Contents in the matter of the

Letters Patent of Arthur R. Wilfley,

Number 590,675, granted September 28, 1897 for

Improvement in Ore Concentrators.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this 7th day of November, in the year of our Lord one thousand nine hundred and seven and of the Independence of the United States of America the one hundred and thirty-second.

[Seal] C. C. BILLINGS,
Assistant Commissioner of Patents.

AMOUNT RECEIVED
$15 Ch
Chief Clerk.

Denver, Colo., March 12, 1897.

Hon. Com. of Patents,
Washington, D. C.

Sir:

Enclosed please find draft for $15, to be

applied in payment of the first government fee in the matter of the application of Arthur R. Wilfley, improvements in concentrators.

Respectfully,

A. J. O'BRIEN.

U. S. PATENT OFFICE.
Mar. 16, 1897.
CHIEF CLERK.

PETITION.

To the Commissioner of Patents:

The Petition of Arthur R. Wilfley citizen of the United States of America, residing at Denver in the County of Arapahoe State of Colorado prays that Letters Patent may be granted to him for improvements in Ore Concentrators as set forth in the annexed specification.

And he hereby appoints A. J. O'BRIEN, of Denver, Colorado, his Attorney with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the Patent, to sign the drawings and to transact all business in the Patent Office connected therewith.

Signed at Denver, in the County of Arapahoe and State of Colorado this 3rd day of March, 1897.

ARTHUR R. WILFLEY.

SPECIFICATION.

To all whom it may Concern:

Be it known, That I, Arthur R. Wilfley, a citizen of the United States of America, residing at Denver in the County of Arapahoe and State of Colorado have

invented certain new and useful improvements in Ore Concentrators and I do declare the following to be a full, clear and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in Ore Concentrators; and it consists of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawing in which is illustrated an embodiment thereof.

In the drawings.

Fig. 1 is a side elevation of the apparatus partly in section.

Fig. 2 is a top or plan view of the same.

Fig. 3 is a plan view of the table.

Fig. 4 is a side elevation of the same.

Fig. 5 is a cross section of the table.

Fig. 6 is a detail view of a lever forming a part of the operating mechanism.

Fig. 7 is a perspective view of one of the riffles, detached.

Similar reference characters indicate corresponding parts in the views, let the numeral 5 designate the table provided with longitudinal riffles 8 attached to its upper surface. These riffles are of unequal length and angular in cross section. The vertical or upwardly projecting part of the riffle is designated by the reference character 8a—and the upper part which lies parallel with the bed of the

table is designated by the reference character 8c. The table tapers from the head toward the foot, where it is narrowest. It is transversely inclined (see Fig. 5), the gangue being discharged at its lower edge and the mineral at the tail thereof. The riffles increase in length from the upper edge of the table downward, where they are longest. The lowermost riffle extends nearly the full length of the table. The table has a longitudinal reciprocating movement, and is supported on rollers 7 mounted on a suitable stationary support.

Insert A June 24 '97

The mechanism for actuating the table will now be described. The extremity of the table farthest to the left (see Figs. 1 to 4 of the drawing) will, for convenience of description in this specification, be termed the head, while the opposite extremity is termed the tail of the table. To the head end of the table is attached a keeper 9 which is engaged by one extremity of a vertical lever 10 fulcrumed at 12 on a support 13 mounted on the stationary frame 14. The upper arm of the lever 10 is slotted (see Fig. 6) to receive a bolt 15, which holds a block 16 in place on the lever, This block carries an antifrictional roller 17 which engages the outer wall of the keeper 9. The block 16 is adjustable for the purpose of changing the bearing point on the keeper and thereby regulating the length of the table's stroke.

The lower arm of the lever 10 is provided with a bearing 18 which is engaged by one extremity of a link 19. This link is connected at 21 with a link 20 forming a toggle joint. One extremity of the link 20

engages a bar 22 attached to the stationary frame. The pin 21 connecting the two toggle parts also passes through one extremity of a pitman 23, whose opposite extremity is connected with a wrist 24 on a crank 25 carried by a shaft 26 journalled in an upright support 27 mounted on the stationary frame 14. The shaft 26 is provided with a pulley 28 which may be connected with any suitable motor for operating the mechanism. The outer extremities of the toggle are open, being simply recessed or forked to engage the bearings 18 and 22 respectively. Hence, as the shaft 26 is rotated, the toggles only impart the backward movement to the table or move it toward the left (see Fig. 3); the forward or reverse movement is effected or imparted by the recoil of a spring 29, which is compressed or placed under tension by the table during its backward movement.

In the operation of the machine, the material to be treated is discharged in the form of a pulp upon the upper left hand corner of the table (see Fig. 3). The gangue passes transversely downwardly over the angular longitudinal riffles and is discharged over the lower edge of the table,

which, as before stated, is transversely inclined. The mineral is caught by the riffles and the concentrates discharged as a comparatively clean product at the lower right hand corner of the table. By means of the riffles, the separation of the mineral from the gangue is effected. They check the tendency of the mineral to move transversely downward with the gangue. The part 8a of the riffles

Sub B June 24-97

would be sufficient alone to catch the larger and heavier particles of mineral; but some of the more minute particles would be forced over the riffles and
June 24 '97 carried downward with the gangue, [and perhaps finally lost] were it not for the part 8c of the riffles which checks this tendency and allows specific gravity to prevail, the same as in hand panning. It is well known that the finest particles of mineral can be saved by hand panning. The specific gravity of the finest particle of gold is, of course, the same as the largest nugget, and if the proper conditions exist, the minute particle can be saved as well as the nugget. The object of my angular riffles is to produce the conditions necessary to save, not only the largest, but also the finest mineral particles. Under ordinary conditions, these fine particles, when acted on by a current of water, are carried along with the water, and consequently lost with the gangue. The upper part 8c of my riffle checks the tendency of these light particles to pass over the riffles with the water. Hence, they are confined by the bed of the table below the part 8c of the

riffles above, while the part 8a of the riffles checks their downward movement. Hence, under the influence of the table's movement or vibration, the mineral particles, both fine and coarse, are caught by the riffles. These mineral particles are, however, gradually moving toward the tail of the table under the influence of the latter's movement imparted by the operating mechanism heretofore explained. Hence, when the mineral reaches the free extremity of the uppermost riffle, it is, for a brief space of time, subjected to the free or unrestrained action of the water before passing to the riffle next below. During this space of time; it is deprived of some gangue which was also caught by the first riffle. The gangue once separated is carried downward by the water, while the mineral is caught by the next riffle and so on, each riffle in turn delivering a cleaner concentrate to the riffle next below until the lowermost riffle discharges the clean product at the lower right hand corner of the table.

It will be observed by an inspection of my operating mechanism that the length of the table's stroke may be regulated without changing altering or interfering with the quality of the movement imparted by the toggle. In other words, the speed of the table is always uniform when passing a given point in the same direction, regardless of the length of the table's stroke, which is regulated by adjust-

ing the height of the roller 17 on the lever. That is to say, the speed of the table is always the same when it has reached its limit of movement, or any other given part of its stroke when traveling in the same direction, whether the stroke be long or short.

With other toggle movements, as applied to this class of machines, the length of stroke is regulated by changing the point where the lower extremity of the connecting rod or pitman is attached to the toggle. This is equivalent to changing the length of the pitman and, of course, not only changes the length of the table's stroke, but also the quality of the movement. For instance, if the pitman be made shorter, the point where the toggle links are connected must move further upward but not so far downward, and vice versa. In other words, by changing the length of the pitman (or changing the point where it is attached to the toggle, which is the same thing), the angle of the links becomes greater when the table has reached its limit of movement in one direction, and less when the table has reached its limit of movement in the opposite direction. Hence, in such constructions, the speed of the table at a given point in its stroke varies as the length of the stroke is changed.

Having thus described my invention what I claim is:-

Sub. 6. June 24-'97

1. The transversely inclined concentrating table having longitudinal riffles varying in length, the riffle nearest the upper edge of the table being shortest and that nearest the lower edge of the table longest, while the intermediate riffles increase in length from the upper part of the table downward.

2. The transversely inclined concentrating table having longitudinal riffles of angular shape, the said riffles increasing in length from the upper edge of the table downward, the riffles being angular in shape and composed of the upwardly projecting part 8a and the part 8c projecting toward the upper edge of the table

3. A transversely inclined concentrating table having a longitudinal angular riffles composed of the parts 8a and 8c, the part 8a projecting upward from the bed of the table, and the part 8c extending toward the upper edge of the table and forming a suitable angle with the part 8a.

4. The combination with an ore separating table, of means for operating the same comprising a toggle, an operating pitman and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table.

5. The combination with an ore concentrating table, of means for operating the same comprising a toggle joint, and operating pitman and a lever, one link of the toggle

engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable bearing for regulating the length of the table's stroke

6. The combination with an ore separating table, of means for operating the same comprising a toggle joint, an operating pitman and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable roller adapted to engage a keeper carried by the table

7. The combination with an ore separating table, of means for operating the same comprising a toggle joint, an operating pitman and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable roller, said roller being mounted on a block adjustably attached to the lever.

8. The combination with an ore separating table, of means for operating the same comprising a toggle joint, an operating pitman and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with a vertical slot, and a block held in place by a bolt passing through the slot and carrying an anti-frictional roller engaging a keeper on the table.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR R. WILFLEY,

ALFRED J. O'BRIEN.

G. J. ROLLANDET.

OATH.

State of Colorado,

County of Arapahoe,—ss.

Arthur R. Wilfley, the above named petitioner, citizen of the United State of America, and resident of Denver in the County of Arapahoe and State of Colorado being duly sworn (or affirmed), deposes and says that he verily believes himself to be the original, first and sole inventor of the improvements in Ore Concentrators described and claimed in the foregoing specification; that the same has not been patented to him or to others with his knowledge or consent, in any country; that the same has not to his knowledge been in public use or on sale in the United States for more than two years prior to this application and he does not know and does not believe that the same was ever known or used prior to his invention thereof.

ARTHUR R. WILFLEY. (L. S.)

Sworn to and subscribed before me, this 3rd day of March, 1897.

GERNIT J. ROLLANDET,

Notary Public.

My commission expires May 27, '97.

U. S. PATENT OFFICE.
Mar. 16, 1897.
CHIEF CLERK.
Serial No. 627,798. Paper No. ½.
Application.
Filed Mar. 16, 1897.
A. R. Wilfley.

2—260.

Div. .... Room 243
All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Paper No. ....
All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., Apr. 19, 1897.
Mailed " " "

Arthur R. Wilfley,
Care A. J. O'Brien,
Denver, Colorado.

Please find below a communication from the EXAMINER in charge of your application, #627,798, filed Mar. 16, 1897, for Ore Concentrators.

BENJ. BUTTERWORTH,
~~E. B. Moore,~~
Commissioner of Patents.

The statement in last three lines of page 6, requires modification, since the *rate* of movement of the table varies as the length of the lever between pivot *12* and bearing *17*, so long as that of the toggle does not change.

Claim 1 fails to distinguish from, and is rejected

in view of 415,999, Gates, Nov. 26th, 1889—Washers (C). See, also, 513,849, Waitt Jan. 30th 1894—same sub-class.

Claim 2 is rejected in view of 149,622, Wilder, Apr. 14th, 1874; or 349,504, Krause, Sept. 21st, 1886; 526,242, Look, Sept. 18th, 1894—Washers (C), and 170,978, Allain et al., Dec. 14th, 1875—Washers (B). See also, 528,503, Chatterson, Oct. 30th, 1894; and 565,812, Stoddard, Aug. 11th; 1896—Washers (C).

Claim 3 is rejected in view of Gates of Waitt Allain et al., and Stoddard, cited.

Claim 4 expresses no more than the substitution of a toggle for the cam of 203,872, Bagley, May 21st, 1878; or 291,270, Bailey et al., Jan. 1st, 1884—Washers (C)—destitute of invention in view of e. g., 27,882, Blake, Apr. 17th, 1860; or 158,800, Krom, Jan. 19th, 1875—Ore & Coal, Crushers.

Claim 5 is rejected in view of the references for claim 4, and 311,863, Cherney & Davis, Feb. 3d, 1885—Washers (C).

Claim 6 is not seen to present anything patentable over the references for claim 5, Gates and Chatterson, cited. It is merely a matter of judgment whether the anti-friction roller be carried by the table or the lever.

Claim 7 is rejected in view of the references for claim 6. See feature *H,* of Gates, cited.

Claim 8 is rejected as being for a mere permutation of features old in the above cited references.

LEWIS B. WYNNE,

Ex'r.

T. F. M. Div. XXV.

Serial No. 627,798. Paper No. 1.
Ex'r's Letter Rejection.
Dated Apr. 19, 1897.
Wilfley, A. R.

Denver, Colo., June 21, 1897.

Room 243.
Arthur R. Wilfley.
Ore concentrators.
Filed March 16, 1897.
Serial No. 627,798.

Hon. Com. of Patents: In response to Office Letter of April 19, 1897, in the above entitled case, the following amendment is made:

After the sentence closing with "table" in the 11th line of page 3 of the specification add the following:

"To the left of the riffle extremities (see Fig. 3), there is a triangular portion A of the table which
A is smooth or free from riffles. The function of this smooth or unriffled portion of the table will be hereinafter described."

Erase all beginning with "The" in the first line of page 5 and ending with "gangue" in the 7th line of the same page and substitute the following:/"All
B the mineral, together with a portion of the gangue is first caught by the riffles, and under the influence of the table's motion is carried longitudinally toward the foot of the table, until it reaches the smooth or unruffled portion A of the table where it is acted on by the water which effects a perfect or

Arthur R. Wilfley.—2.

approximately perfect separation of the gangue from the mineral. As the material caught by the uppermost and shortest riffle passes to the portion A of the table, the action of the water, which is fed to the upper edge of the table, carries the gangue downward to the next riffle, while the mineral remains on the smooth portion A and is carried towards the tail of the table, where it is finally discharged. It is expected that some of the mineral caught by the uppermost and shortest riffle will be carried downward with the gangue to the next riffle which is longer. After leaving this last named riffle and passing to the smooth or unriffled portion of the table, the water again acts on the material and carries the gangue downward to the next riffle, leaving the clean mineral on the smooth portion A of the table. If any mineral escapes with the gangue the second time, it will be caught by the riffle next below and again subjected to the separating action of the water as soon as it reaches the smooth portion A of the table. In this manner, the material is carried transversely downward and longitudinally forward, the gangue being discharged at the lower edge of the table, completely impoverished of its mineral values, while the latter are discharged at the foot or tail of the table. A portion of the gangue, that is to say, the lighter part thereof, passes over each riffle in succession from the shortest or uppermost to the longest or lowermost

Arthur R. Wilfley.—3.

riffle. The mineral and the heavier gangue are caught by the riffles and finally separated on the

smooth portion A of the table. This combination in a concentrating table of riffles [of varying length], for catching the mineral, and a smooth, plain, or unriffled portion at the extremities of the riffles where the final separation is effected through the action of the water, is believed to be entirely new in an apparatus of this class. A riffle is the best means of catching mineral, while a smooth, plain, or unriffled surface is the best for effecting the separation of the mineral from the gangue caught with the mineral by the riffles, the separation being effected by the action of water.

Aug. 17/97

While I prefer to employ the angular riffle shown and described in this application, I do not limit the invention to any special construction of riffle. The function of the angular riffles will now be described in detail."

After the word "gangue" in the 11th line of page 5 insert "and perhaps finally lost."

Erase all beginning with "These mineral" in the 4th line on page 6 and ending with "table" in the 18th line of the same page. Also erase all beginning with "In other" in the 4th line from the bottom of page 6 and ending with "short" in the 5th line from the top of page 7.

Erase the original claims and substitute the following:

Arthur R. Wilfley- 4.

"1. A transversely inclined concentrating table having a movement whose tendency is to carry the material longitudinally forward toward the tail or foot of the table, said table being provided with a number of riffles extending longitudinally a portion of the distance from its head toward its foot, the table having a smooth, plain, or unriffled portion extending from the extremities of the riffles toward the tail of the table, whereby the material as it leaves the riffles is subjected to the action of the water on the smooth portion of the table and the final separation of the mineral from the gangue effected.

2. A transversely inclined concentrating table having a series of longitudinal riffles extending a portion of the distance from the head toward the tail of the table, the table being provided with a smooth, plain, or unriffled portion located at the extremities of the riffles.

3. A concentrating table having a number of longitudinal riffles extending a portion of the distance from its head toward the tail thereof, the table being provided with an unriffled portion extending from the riffle extremities toward the tail or foot of the table.

4. A transversely inclined concentrating table having a number of longitudinal riffles extending a portion of the table's length from the head toward the foot, said riffles being of unequal length, the uppermost being the shortest while the other riffles increase in length from the upper

Arthur R. Wilfley- 5.

edge to the lower edge of the table, the table having a plain or unriffled portion lying at the extremities of the riffles and adapted to receive the material caught by the riffles.

Canceled Aug 17, 97.

5. A transversely inclined concentrating table having angular longitudinal riffles extending a portion of its length from the head toward the tail of the table, the table being provided with a plain or unriffled portion located at the extremities of the riffles and extending to the tail of the table.

6. A transversely inclined concentrating table having a number of riffles extending longitudinally thereof from the head toward the tail of the table, said riffles being composed of the parts 8a and 8c, the part 8a projecting upward from the bed of the table and the part 8c extending toward the upper edge of the table and forming a suitable angle with the part 8a, the table being provided with a plain or unriffled portion located at the extremities of the riffles and extending to the tail of the table

7. The combination of a transversely inclined concentrating table having a series of longitudinal riffles, and a plain or unriffled portion located at the extremities of the riffles, means for discharging water upon the upper edge of the table and means for imparting to the table a longitudinally reciprocating movement of a character adapted to cause the

material to travel from the head toward the tail of the table.

8. The combination of a transversely inclined concentrating table having a series of longitudinal riffles, and a plain or unriffled portion at the extremities of the riffles, means for feeding the material to the upper portion of the head of the table, means for discharging water on the upper edge of the table, and means for imparting to the table a reciprocating movement of such a character as to cause the material to travel from the head toward the foot of the table.

9. The combination of a transversely inclined concentrating table having a series of longitudinal riffles of unequal length extending from the head toward the tail of the table, and uppermost riffle being shortest and the riffles increasing in length from the upper to the lower edge of the table, the table having a plain or unriffled portion located at the extremities of the riffles, means for feeding the material to the upper portion of the table's head, means for discharging water to the upper edge of the table, and means for imparting to the table a movement adapted to cause the material to travel from the head toward the tail of the table.

3 ~~10.~~ The combination of a transversely inclined concentrating table having a number of longitudinal riffles of unequal length extending from the head toward the tail of

Arthur R" Wilfley- 7.

The table, said riffles increasing in length from the upper toward the lower edge of the table, said table being provided with a plain or unriffled portion at the extremities of the riffles, and means for imparting to the table a longitudinally reciprocating movement comprising a toggle, an operating pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the head of the table.

Cancelled Aug 17.'97

11. The combination of a transversely inclined table having a number of longitudinal riffles extending from the head toward the tail of the table, the table being provided with a plain portion extending from the extremities of the riffles to the foot of the table, and means for imparting to the table a longitudinally reciprocating movement, said means comprising a toggle joint, an operating pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable bearing for regulating the length of the table's stroke.

4 12. The combination of a transversely inclined concentrating table having a number of longitudinal riffles extending from the head toward the foot of the table, the table being provided with a plain or unriffled portion located at the extremities of the riffles, and means for imparting to the table a longitudinal reciprocating movement comprising a toggle joint, an operating pitman and a lever,

Arthur R. Wilfley—8.

one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable roller adapted to engage a keeper carried by the table.

5 ~~13.~~ The combination of a transversely inclined concentrating table having a series of longitudinal riffles extending from the head toward the foot of the table, the table being provided with a plain or unriffled portion extending from the riffle extremities to the foot of the table, and means for imparting to the table a longitudinally reciprocating movement, said means comprising a toggle joint, an operating pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable roller, said roller being mounted on a block adjustably attached to the lever.

6 ~~14.~~ The combination of a transversely inclined concentrating table having a number of longitudinal riffles extending from the head toward the tail of the table, the table being provided with a plain or unriffled portion located at the extremities of the riffles, and means for imparting to the table a longitudinally reciprocating movement comprising a toggle joint, an operating pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm

Arthur R. Wilfley—9.

of the lever is connected with the table and provided with a vertical slot, and a block held in place by a bolt passing through the slot and carrying an antifrictional roller engaging a keeper on the table.

7 ~~15.~~ The combination of a transversely inclined concentrating table having a series of riffles extending longitudinally from the head toward the tail of the table, said riffles being of unequal length, the uppermost being the shortest and the riffles increasing in length from the upper to the lower edge of the table, the table being provided with a plain or unriffled portion of suitable area located at the extremities of the riffles, means for feeding the material to the upper portion of the table's head, means for discharging water on the upper edge of the table, and suitable means for imparting to the table a longitudinally reciprocating movement of a character adapted to move the material from the head toward the tail of the table."

After a careful examination of the references, the claims as amended are believed allowable. It would seem that applicant is entitled to a broad claim for a table having a series of longitudinal riffles extending from its head toward its foot, the table being provided with a plain or unriffled portion at the extremities of the riffles whereby the separation if the mineral from the gangue is finally effected through the action of the water on the material after it leaves the riffles and reaches the plain or unriffled

portion of the table. This construction and mode of operation are nowhere disclosed by the references, and so far as applicant is aware, is entirely new in an apparatus of this class. The operation is so clearly set forth in the specification, as amended, and

so fully pointed out in the claims that further argument is believed superfluous.

Respectfully submitted,
A. J. O'BRIEN,
Attorney for Wilfley.

United States
Jun. 24, 1897.
Patent Office.

Patent Office.
June 25, 1897.
Division XXV.

Serial No. 627,798. Paper No. 2.
Amendment
A. C.
Filed June 24, 1897.
A. R. Wilfley.

Denver, Colo., June 23, 1897.

Room 243.

A. R. Wilfley.
Ore concentrator.
Filed March 16, 1897.
Serial No. 627,798.

Hon. Com. of Patents:

In response to Office Letter of April 19, 1897 in the above entitled case, it is applicant's wish that the drawing be corrected by applying the reference character "A" to the plain or unriffled portion of the table in Fig. 3 of the drawing to correspond with the amendment forwarded June 21, 1897.

Respectfully submitted,
A. J. O'BRIEN,
Attorney for Wilfley.

PATENT OFFICE.
Jun. 26, 1897.
DIVISION XXV.

UNITED STATES.
Jun. 26, 1897.
PATENT OFFICE.

Serial No. 627,798 Paper No. 3
Letter to Office
Filed June 26, 1897.
A. R. Wilfley.

2—260.

Div. .... Room 243
All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Paper No. ....
All communications respecting this application should give the serial number, date of filing, and title of invention.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., July 29, 1897.
Mailed " " "

Arthur R. Wilfley,
Care A. J. O'Brien,
Denver, Col.

Please find below a communication from the EXAMINER in charge of your application, #627,798, filed Mar. 16, 1897, for Ore Concentrators.

BENJ. BUTTERWORTH,
~~E. B. MOORE.~~
Commissioner of Patents.

Case as amended June 24th, 1897, further considered.

The first three claims are rejected in view of

258,879, Blatchly et al., June 6th, 1882—Washers (C).

Claim 4 may possibly be allowed.

The form of riffle must be better distinguished than by the term "angular," and until this is done, claim 5 is rejected in view of Blatchly et al., cited; but see 566,534, Pike, Aug. 25th, 1896—Washers (C).

Claims 6, 7 and 8 are rejected in view of the above, and 560,750, Pierce, May 26th, 1896—Amalgamators, Plate.

Claims 9 and 10 may possibly be allowed.

Claim 11 is rejected in view of Blatchly et al., cited, Krom and 291,270, Bailey et al., of record. Applicant has merely aggregated with Blachly et al., old reciprocating means shown in Krom.

Claim 12 may possibly be allowed, as may 13th, 14th and 15th.

LEWIS B. WYNNE,
Ex'r.
Div. XXV.

T. F. M.

Serial No. 627,798. Paper No. 4.
Ex'r's Letter Rejection
Dated July 29, 1897.
Wilfley, A. R.

Denver, Colo., August 14, 1897.

Room 243.
A. R. Wilfley.
Ore Concentrator.
Filed March 16, 1897.
Serial No. 627,798.

Hon. Com. of Patents: In response to Office Letter of the 29th ult. in the above entitled case, the following amendment is made:

In the 4th line of page 3 of the last amendment, namely that filed June 24, 1897, after the word "riffles" insert "of varying length."

In the 6th line of claim 1, after "foot" insert, "said riffles varying in length for the purpose specified."

Erase claims 2, 3, 5, 6, 7, 8, 9, and 11 and adjust originals as to remaining claims.

In view of the references it is believed that the first claim, as amended, should be allowed. That is to say, it is thought that applicant is entitled to a claim in which the arrangement of the riffles is not specified with the same preciseness as set forth in claim 4, since it would be quite easy to construct a machine that would not come within the literal wording of the language of claim 4 and yet have substantially applicant's construction. He, therefore, wishes to claim the riffles of different lengths in

language somewhat more general than that set forth in the claims already allowed. The insertion in claim 1 by this amendment is believed to be suffi-

ciently exact, and at the same time, sufficiently comprehensive to answer applicant's purpose. The claim is also believed clearly allowable, in view of the Blatchly reference, since his riffles or corrugations formed in the rubber applied to the table, are all of the same length. Hence, his table will not perform the function of applicant's table.

It may be well to state that applicant's concentrating table has been in actual use for a considerable length of time, and has been found clearly satisfactory for the purpose intended. Applicant's argument, therefore, with reference to the variation in the length of the riffles is founded on actual fact and experience, as contradistinguished from mere theory.

It is evident that by varying the length of these riffles, the finer mineral may be saved. The upper riffles for instance catch the mineral and discharge it upon the smooth or unriffled portion of the table. The water which acts to separate the mineral from the gangue will not only carry the gangue downward, but also some of the finer mineral particles, while the coarser and heavier particles will remain on the smooth portion of the table. These finer mineral particles are caught by the next riffle and again

carried outward to the smooth portion of the table and the coarser particles again left upon the table and so on, with the result that by the time the finest mineral particles have passed downward to the lower edge of the table, they will be caught and saved while the gangue is discharged. Hence, applicant's concentrator is specially adapted for saving fine min-

eral, or that for which the ordinary concentrating tables are least adapted.

Respectfully submitted,
A. J. O'BRIEN,
Attorney for Wilfley.

UNITED STATES
AUG. 17, 1897.
PATENT OFFICE

PATENT OFFICE
Aug. 18, 1897.
DIVISION XXV.

Serial No. 627,798. Paper No. 5.
Amendment and
Argument.
Filed Aug. 17, 1897.
A. R. Wilfley.

ISSUE DIVISION.

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Serial No. 627,798.

Serial No. 627,798.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C.,
August 23, 1897.

Arthur R. Wilfley,
c/o A. J. O'Brien,
Denver, Colo.

SIR: Your APPLICATION for a patent for an IMPROVEMENT IN Ore Concentrators filed Mar. 16, 1897, has been examined and ALLOWED.

The final fee, Twenty Dollars, must be paid, and

the Letters Patent bear date as of a date not later than SIX MONTHS from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of Section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date, and on which their term begins to run; but to do this properly applicants will be expected to pay their final fees at least TWENTY DAYS prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts, preparatory to final signing and sealing, will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR and TITLE OF INVENTION AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

If you desire to have the patent issued to ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of Specifications and Drawings will be charged for at the following rates: Single

☞ IN REMITTING THE FINAL FEE GIVE THE SERIAL NUMBER AT THE HEAD OF THIS NOTICE.

Copies, uncertified, 10 cents each. The money should accompany the order.

Very respectfully,

BENJ. BUTTERWORTH,,

Commissioner of Patents.

After allowance, and prior to payment of the final fee, applicants should carefully scrutinize the description to see that their statements and language are correct, as mistakes not incurred through the cault of the office, and not affording legal grounds for reissues, will not be corrected after the delivery of the letters patent to the patentee or his agent.

[Stamped in margin:] The within title is that given by the Examiner in charge as most appropriate to your invention. Should you desire change in the same, satisfactory reasons MUST be given therefor on or before the payment of the final fee.

CERTIFICATE.

Amount Received

$20—

Chief Clerk.

Denver, Colo., Sept. 3, 1897.

Hon. Com. of Patents,

Washington, D. C.

Sir:

Enclosed please find certificate of deposit for twenty dollars in payment of the final *gv*ernment fee in the matter of the application of Arthur R. Wilfley, improvements in Ore concentrators, filed March 16,

1897, Serial No. 627,798, allowed August 23, 1897.

Respectfully,

A. J. O'BRIEN.

U. S. PATENT OFFICE.

Sep. 7, 1897.

CHIEF CLERK:

2–213.

Forwarded from Div. —— to Examiner of Interferences.

Paper No. ——

[INTERFERENCE.]

U. S. PATENT OFFICE.

Jan 4 1899

Ex'r of Interferences

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., Jan. 3, 1899.

Interference No. 19,820

Arthur R. Wilfley,
Care A. J. O'Brien,
Denver, Colorado.

Please find below a copy of a communication from the Examiner concerning your application No. 627,798, filed Mar. 16, 1897, for Ore Concentrators. Patent No. 590,675, dated Sept. 28, 1897.

Very respectfully,

C. H. DUELL,
~~F. I. ALLEN,~~
Commissioner of Patents.

Room No. 243

All communications should be addressed to "The Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others, hereafter specified, and the question of priority will be determined in conformity with the Rules.

The statement demanded by Rule 110 must be sealed up and filed on or before the 8th day of Feb., 1899, with the subject of the invention, and name of party filing it, indorsed on the envelope. The subject-matter involved in the interference is

"1. A transversely inclined concentrating table having a movement whose tendency is to carry the material longitudinally forward toward the tail or foot of the table, said table being provided with a number of riffles extending longitudinally a portion of the distance from its head toward its foot, said riffles varying in length for the purpose specified, the table having a smooth, plain, or unriffled portion extending from the extremities of the riffles toward the tail of the table, whereby the material as it leaves the riffles is subjected to the action of the water on the smooth portion of the table and the final separation of the mineral from the gangue effected."

"2. A transversely inclined concentrating table having a number of longitudinal riffles extending a portion of the table's length from the head toward the foot, said riffles being of unequal length, the uppermost being the shortest while the other riffles increase in length from the upper edge to the lower

edge of the table, the table having a plain or unriffled portion lying at the extremities of the riffles and adapted to receive the material caught by the riffles."

"3. The combination of a transversely inclined concentrating table having a series of riffles extending longitudinally from the head toward the tail of the table, said riffles being of unequal length, the uppermost being the shortest and the riffles increasing in length from the upper to the lower edge of the table, the table being provided with a plain or unriffled portion of suitable area located at the extremities of the riffles, means for feeding the material to the upper portion of the table's head, means for discharging water on the upper edge of the table, and suitable means for imparting to the table a longitudinally reciprocating movement of a character adapted to move the material from the head toward the tail of the table.

The 1st count in the above issue is your 1st claim, which interferes with the 3d claim of an application of Ira A. Cammett, of Denver, Colorado, whose attorney of record is Mr. Harold Binney, of New York City, New York.

The 2d count in the above issue is your 2d claim, which interferes with Cammett's 4th claim.

The 3d count in the above issue is your 7th claim, whish interferes with Cammett's 5th claim.

In case of decision unfavorable to Cammett, his 1st,

2d and 8th claims will be held unpatentable irrespective of other considerations.

LEWIS B. WYNNE,
Primary Examiner,
Division XXV.

N. F.

Pat. No. 590,675.
Serial No. 627,798. Paper No. 6.
Exrs. Letter Intf.
Dated Jan. 3, 1899.
Wilfley, A. R.

2—079.

INTERFERENCE. CARD.

Interference No. 19820 Paper No. 6.
Name, A. R. Wilfley,
Pat. 627,798.
Serial No. 590–675.
Title, Ore Concentrators.
Filed, March 16–97.
Dated Sept. 28–97.
Interference with Ira A. Cammett.

DECISIONS OF

Primary Examiner,.....Dated Jan. 3–1899.
Exr. of Interferences,..... " .....
Board,..... " .....
Commissioner,..... " .....

REMARKS:

.....
.....

This should be placed in each application or patent involved in interference in addition to the interference letters by Primary Examiner.

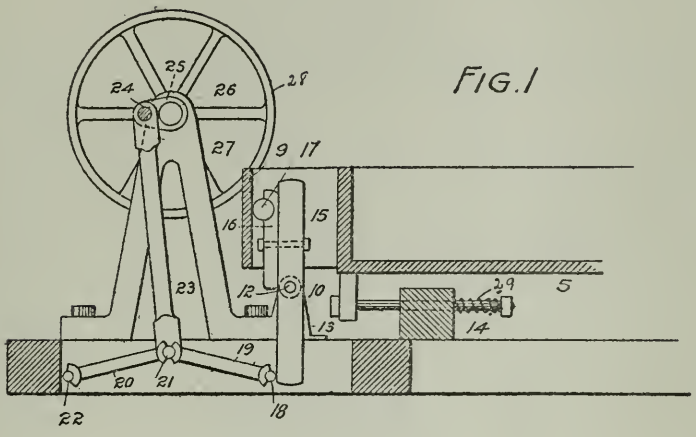
(No Model.) 2 Sheets—Sheet 1

A. R. WILFLEY.

ORE CONCENTRATOR.

No. 590,675. Patented Sept. 28, 1897.

FIG. 1



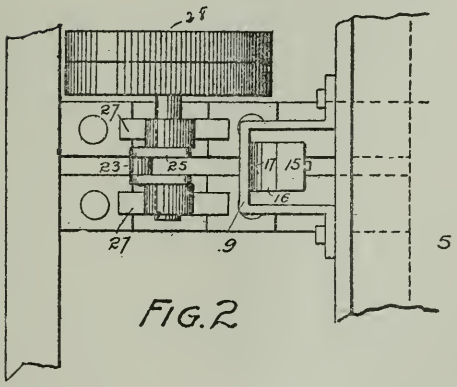


FIG. 2

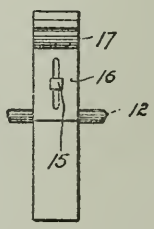
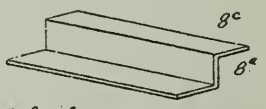


FIG. 6.



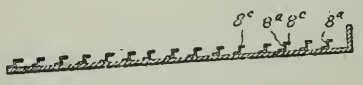


FIG. 7

FIG. 5

Witnesses
J. J. Holland
Edith Hopkinsworth.

Inventor
A. R. Wilfley
By his Attorney
A. J. Bowen

(No Model.) 2 Sheets—Sheet 2.

A. R WILFLEY.

ORE CONCENTRATOR.

No. 590,675. Patented Sept. 28, 1897.

FIG. 3

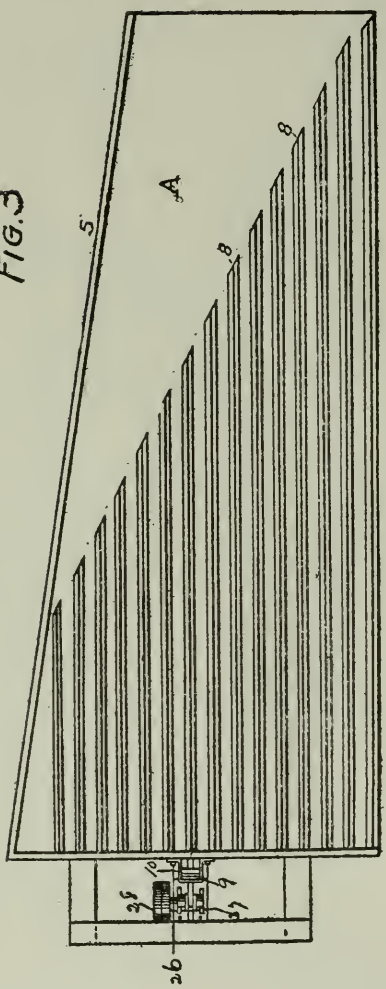
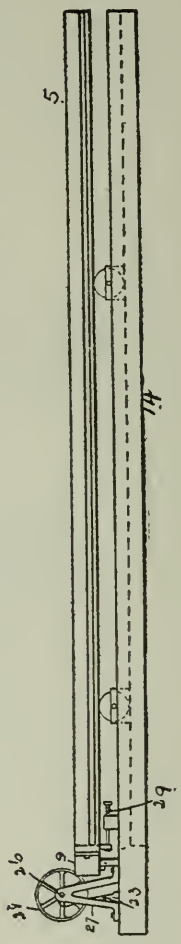


FIG. 4



Witnesses
E. J. Gallaudet
Edith Hinsworth.

Inventor
A. R. Wilfley
By his Attorney
A. J. O'Brien

UNITED STATES PATENT OFFICE.

ARTHUR R. WILFLEY, OF DENVER, COLORADO.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 590,675, dated September 28, 1897.
Application filed March 16, 1897. Serial No. 627,798. (No Model.)

To all whom it may concern:

Be it known that I, ARTHUR R. WILFLEY, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore-Concentrators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ore-concentrators; and it consists of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of the apparatus, partly in section. Fig. 2 is a top or plan view of the same. Fig. 3 is a plan view of the table. Fig. 4 is a side elevation of the same. Fig. 5 is a cross-section of the table. Fig. 6 is a detail view of a lever forming a part of the operating mechanism. Fig. 7 is a perspective view of one of the riffles detached.

Similar reference-characters indicate corresponding parts in the views.

Let the numeral 5 designate the table, provided with longitudinal riffles 8, attached to its upper surface. These riffles are of unequal length and angular in cross-section. The vertical or upwardly-projecting part of the riffle is designated by the reference-character 8^a, and the upper part, which lies parallel with the bed of the table, is designated by the reference-character 8^c. The table tapers from the head toward the foot, where it is narrowest. It is transversely inclined, (see Fig. 5,) the gangue being discharged at its lower edge and the mineral at the tail thereof. The riffles increase in length from the upper edge of the table downward, where they are longest. The lowermost riffle extends nearly the full length of the table.

To the left of the riffle extremities (see Fig. 3) there is a triangular portion A of the table, which is smooth or free from riffles. The function of this smooth or unriffled portion of the table will be hereinafter described.

The table has a longitudinal reciprocating movement and is supported on rollers 7, mounted on a suitable stationary support.

The mechanism for actuating the table will now be described.

The extremity of the table farthest to the left (see Figs. 1 to 4 of the drawings) will for convenience of description in this specification be termed the "head," while the opposite extremity is termed the "tail" of the table.

To the head end of the table is attached a keeper 9, which is engaged by one extremity of a vertical lever 10, fulcrumed at 12 on a support 13, mounted on the stationary frame 14. The upper arm of the lever 10 is slotted (see Fig. 6) to receive a bolt 15, which holds a block 16 in place on the lever. This block carries an antifrictional roller 17, which engages the outer wall of the keeper 9. The block 16 is adjustable for the purpose of changing the bearing-point on the keeper and thereby regulating the length of the table's stroke.

The lower arm of the lever 10 is provided with a bearing 18, which is engaged by one extremity of a link 10. This link is connected at 21 with a link 20, forming a toggle-joint. One extremity of the link 20 engages a bar 22, attached to the stationary frame. The pin 21 connecting the two toggle parts also passes through one extremity of a pitman 23, whose opposite extremity is connected with a wrist 24 on a crank 25, carried by a shaft 26, journaled in an upright support 27, mounted on the stationary frame 14. The shaft 26 is provided with a pulley 28, which may be connected with any suitable motor for operating the mechanism. The outer extremities of the toggle are open, being simply recessed or forked to engage the bearings 18 and 22, respectively. Hence as the shaft 26 is rotated the toggles only impart the backward movement to the table or move it toward the left. (See Fig. 3.) The forward or reverse movement is effected or imparted by the recoil of a spring 29, which is compressed or placed under tension by the table during its backward movement.

In the operation of the machine the material to be treated is discharged in the form of

pulp upon the upper left-hand corner of the table. (See Fig. 3.) The gangue passes transversely downwardly over the angular longitudinal riffles and is discharged over the lower edge of the table, which, as before stated, is transversely inclined.

All the mineral, together with a portion of the gangue, is first caught by the riffles, and under the influence of the table's motion is carried longitudinally toward the foot of the table until it reaches the smoother unriffled portion A of the table, where it is acted on by the water, which effects a perfect or approximately perfect separation of the gangue from the mineral. As the material caught by the uppermost and shortest riffle passes to the portion A of the table the action of the water, which is fed to the upper edge of the tables, carries the gangue downward to the next riffle, while the mineral remains on the smooth portion A and is carried toward the tail of the table, where it is finally discharged. It is expected that some of the mineral caught by the uppermost and shortest riffle will be carried downward with the gangue to the next riffle, which is longer. After leaving this last-named riffle and passing to the smooth or unriffled portion of the table the water again acts on the material and carries the gangue downward to the next riffle, leaving the clean mineral on the smooth portion A of the table. If any mineral escapes with the gangue the second time, it will be caught by the riffle next below and again subjected to the separating action of the water as soon as it reaches the smooth portion A of the table. In this manner the material is carried transversely downward and longitudinally forward, the gangue being discharged at the lower edge of the table completely impoverished of its mineral values, while the latter are discharged at the foot or tail of the table. A portion of the gangue—that is to say, the lighter part thereof—passes over each riffle in succession from the shortest or uppermost to the longest or lowermost riffle. The mineral and the heavier gangue are caught by the riffles and finally separated on the smooth portion A of the table. This combination, in a concentrating-table, of riffles of varying length for catching the mineral and a smooth, plain, or unriffled portion at the extremities of the riffles, where the final separation is effected through the action of the water, is believed to be entirely new in an apparatus of this class.

A riffle is the best means of catching mineral, while a smooth, plain, or unriffled surface is the best for effecting the separation of the mineral from the gangue caught with the mineral by the riffles, the separation being effected by the action of water.

While I prefer to employ the angular riffle shown and described in this application, I do not limit the invention to any special construction of riffle.

The function of the angular riffles will now be described in detail.

The part 8^a of the riffles would be sufficient alone to catch the larger and heavier particles of mineral, but some of the more minute particles would be forced over the riffles and carried downward with the gangue and perhaps finally lost were it not for the part 8^c of the riffles, which checks this tendency and allows specific gravity to prevail, the same as in hand-panning. It is well known that the finest particles of mineral can be saved by hand-panning. The specific gravity of the finest particle of gold is, of course, the same as the largest nugget, and if the proper conditions exist the minute particle can be saved as well as the nugget. The object of my angular riffles is to produce the conditions necessary to save not only the largest but also the finest mineral particles. Under ordinary conditions these fine particles when acted on by a current of water are carried along with the water, and consequently lost with the gangue. The upper part 8^c of my riffle checks the tendency of these light particles to pass over the riffles with the water. Hence they are confined by the bed of the table below the part 8^c of the riffles above, while the part 8^a of the riffles checks their downward movement. Hence under the influence of the table's movement or vibration the mineral particles, both fine and coarse, are caught by the riffles.

It will be observed by an inspection of my operating mechanism that the length of the table's stroke may be regulated without changing, altering, or interfering with the quality of the movement imparted by the toggle.

With other toggle movements as applied to this class of machines the length of stroke is regulated by changing the point where the lower extremity of the connecting-rod or pitman is attached to the toggle. This is equivaleut to changing the length of the pitman and of course not only changes the length of the table's stroke, but also the quality of the movement. For instance, if the pitman be made shorter the point where the toggle-links are connected must move farther upward, but not so far downward, and vice versa. In other words, by changing the length of the pitman (or changing the point where it is attached to the toggle, which is the same thing) the angle of the links becomes greater when the table has reached its limit of movement in one direction and less when the table has reached its limit of movement in the opposite direction. Hence in such constructions the speed of the table at a given point in its stroke varies as the length of the stroke is changed.

Having thus described my invention, what I claim is—

1. A transversely-inclined concentrating-table having a movement whose tendency is to carry the material longitudinally forward

toward the tail or foot of the table, said table being provided with a number of riffles extending longitudinally a portion of the distance from its head toward its foot, said riffles varying in length for the purpose specified, the table having a smooth, plain, or unriffled portion extending from the extremities of the riffles toward the tail of the table, whereby the material as it leaves the riffles is subjected to the action of the water on the smooth portion of the table and the final separation of the mineral from the gangue effected.

2. A transversely-inclined concentrating-table having a number of longitudinal riffles extending a portion of the table's length from the head toward the foot, said riffles being of unequal length, the uppermost being the shortest while the other riffles increase in length from the upper edge to the lower edge of the table, the table having a plain or unriffled portion lying at the extremities of the riffles and adapted to receive the material caught by the riffles.

3. The combination of a transversely-inclined concentrating-table having a number of longitudinal riffles of unequal length extending from the head toward the tail of the table, said riffles increasing in length from the upper toward the lower edge of the table, said table being provided with a plain or unriffled portion at the extremities of the riffles, and means for imparting to the table a longitudinally-reciprocating movement comprising a toggle, an operating-pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the head of the table.

4. The combination of a transversely-inclined concentrating-table having a number of longitudinal riffles extending from the head toward the foot of the table, the table being provided with a plain or unriffled portion located at the extremities of the riffles, and means for imparting to the table a longitudinal reciprocating movement comprising a toggle-joint, an operating-pitman and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable roller adapted to engage a keeper carried by the table.

5. The combination of a transversely-inclined concentrating-table having a series of longitudinal riffles extending from the head toward the foot of the table, the table being provided with a plain or unriffled portion extending from the riffle extremities to the foot of the table, and means for imparting to the table a longitudinally-reciprocating movement, said means comprising a toggle-joint, an operating-pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with an adjustable roller, said roller being mounted on a block adjustably attached to the lever.

6. The combination of a transversely-inclined concentrating-table having a number of longitudinal riffles extending from the head toward the tail of the table, the table being provided with a plain or unriffled portion located at the extremities of the riffles, and means for imparting to the table a longitudinally-reciprocating movement comprising a toggle-joint, an operating-pitman, and a lever, one link of the toggle engaging one arm of the lever, while the other arm of the lever is connected with the table and provided with a vertical slot, and a block held in place by a bolt passing through the slot and carrying an antifrictional roller engaging a keeper on the table.

7. The combination of a transversely-inclined concentrating-table having a series of riffles extending longitudinally from the head toward the tail of the table, said riffles being of unequal length, the uppermost being the shortest and the riffles increasing in length from the upper to the lower edge of the table, the table being provided with a plain or unriffled portion of suitable area located at the extremities of the riffles, means for feeding the material to the upper portion of the table's head, means for discharging water on the upper edge of the table, and suitable means for imparting to the table a longitudinally-reciprocating movement of a character adapted to move the material from the head toward the tail of the table.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR R. WILFLEY.

Witnesses:

ALFRED J. O'BRIEN.

G. J. ROLLANDET.

(Serial Number,)	DIV. (Ex'r's Book,)
626798	874
	230
	1897.
Patent No	590,675
	Arthur R. Wilfley
of	Denver
County of	
State of	Colorado
Invention	Ore Concentrators
Parts of application filed. Petition	Mar. 16, 1897.
Affidavit	" " "
Specification	" " "
Drawing 2 shts	" " "
Model	not required
Specimen	
First fee Cash	$15. Mar. 16–97
" " Cert.	
App. filed complete	Mch. 16–97.
Examined	Aug. 20th, 1897, Lewis B. Wynne,
Countersigned:	S. M. Pool,
8–21–97.	For Commissioner.
Notice of allowance	August 23, 1897. , 189 .
Final fee Cash	, 189 . , 189 .
" " Cert.	$20 Sept. 7, 1897. , 189 .
Patented	September 28, 1897. , 189 .
	A. J. O'BRIEN,
	Denver, Colo.

1897.

CONTENTS:

Application papers. O.K.

1 Rejection Apr. 19, 1897.
2. Amendment A–C Jun. 24, 1897.
3. Letter to Office Jun. 26, 1897.
4. Rejection July 29, 1897.
5. Amendment & Argt. Aug. 17, 1897.
6. Interference Card.
7. Fav. Dec. 11 Aug. 29th, 1899.
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23.

TITLE:

IMPROVEMENT IN Ore Concentrators.

H. R. Q.

L. M. F.

U. S. PATENT OFFICE.

COPY MADE Nov. 190

18149 5/07

[Endorsed]: In the District Court of the Fifth Judicial District of the Territory of Arizona. The Mine and Smelter Supply Co. vs. Arizona Copper Co. In Equity—#21A. Defendant's Exhibit "J." Certified Copy of File Wrapper and Contents of Wilfley Patent No. 590,675.

[Seal] A. M. PARKINS,
Special Examiner.

Filed Nov. 18, 1912. Allan B. Jaynes, Clerk. By Frank E. McCrary, Dep.

[Certificate of Clerk U. S. District Court to Defendant's Exhibit "J."]

United States of America,
District of Arizona,—ss.

I, Allan B. Jaynes, Clerk of the United States District Court for the District of Arizona, do hereby certify that the above and foregoing is the original of Defendant's Exhibit "J," Certified copy of file-wrapper and contents of Wilfley Patent No. 590,675, which I hereby transmit to the United States Circuit Court of Appeals, Ninth Judicial Circuit, as a further supplemental transcript of the record in the cases of Mine and Smelter Supply Company, a Corporation, vs. Detroit Copper Mining Company of Arizona, a Corporation, No. 11, and Mine and Smelter Supply Company, a Corporation, vs. Arizona Copper Company, a Corporation, No. 12, in said court.

In Testimony Whereof, I have hereunto set my hand and affixed the seal of said court at Phoenix, Arizona, this 23d day of August, 1913.

[Seal] ALLAN B. JAYNES,
Clerk.